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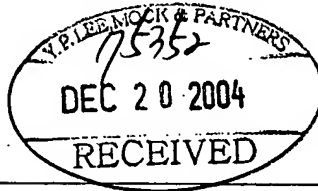
PATENT COOPERATION TREATY

rec'd PCT/PTO 09 FEB 2005

From the
INTERNATIONAL PRELIMINARY EXAMINING

To:
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PCT

NOTIFICATION OF TRANSMITTAL OF
INTERNATIONAL PRELIMINARY
EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing
(day/month/year) 15 DECEMBER 2004 (15.12.2004)

Applicant's or agent's file reference
PH-18068-PCT

IMPORTANT NOTIFICATION

International application No.

PCT/KR2002/001951

International filing date (day/month/year)

18 OCTOBER 2002 (18.10.2002)

Priority date (day/months/year)

12 AUGUST 2002 (12.08.2002)

Applicant

POSTECH FOUNDATION et al

1. The applicant is hereby notified that International Preliminary Examining Authority transmits here with the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**
The applicant must enter the national phase before each elected office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details in the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/KR



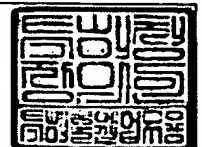
Korean Intellectual Property Office
920 Dunsan-dong, Seo-gu, Daejeon 302-701,
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Facsimile No. 82-42-472-7140

Authorized officer

COMMISSIONER

Telephone No. 82-42-481-5231



PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

| | | |
|---|---|--|
| Applicant's or agent's file reference PH-18068-PCT | <div style="display: flex; justify-content: space-between;"> <div> FOR FURTHER ACTION </div> <div> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) </div> </div> | |
| International application No. PCT/KR2002/001951 | International filing date (day/month/year) 18 OCTOBER 2002 (18.10.2002) | Priority date (day/month/year) 12 AUGUST 2002 (12.08.2002) |
| International Patent Classification (IPC) or national classification and IPC IPC7 C01F 7/02, B82B 1/00, B82B 3/00 | | |
| Applicant POSTECH FOUNDATION et al | | |

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:

I ☒ Basis of the report

II ☐ Priority

III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability



IV ☐ Lack of unity of invention

V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

VI ☐ Certain documents cited

VII ☐ Certain defects in the international application

VIII ☐ Certain observations on the international application

| | |
|--|--|
| Date of submission of the demand 17 FEBRUARY 2004 (17.02.2004) | Date of completion of this report 09 DECEMBER 2004 (09.12.2004) |
| Name and mailing address of the IPEA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140 | Authorized officer KIM, Yong Jung Telephone No. 82-42-481-5557  |

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/KR2002/001951

I. Basis of the report

1. With regard to the elements of the international application:*

- ☒ the international application as originally filed
- ☐ the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the claims:
pages _____, as originally filed
pages _____, as amended (together with any statement) under Article 19
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the drawings:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language English which is

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☒ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed," and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION

International application No.

PCT/KR2002/001951

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

| | | | |
|-------------------------------|--------|------|-----|
| Novelty (N) | Claims | 1-33 | YES |
| | Claims | None | NO |
| Inventive step (IS) | Claims | 1-33 | YES |
| | Claims | None | NO |
| Industrial applicability (IA) | Claims | 1-33 | YES |
| | Claims | None | NO |

2. Citations and explanations (Rule 70.7)

1. The invention relates to a method of manufacturing a mesoporous alumina molecular sieve and alumina nanotube by using a surfactant and a use of the alumina nanotube as a hydrogen storage material.

2. Reference is made to the following document:

D1 : JP 20001-205600 A1 (31.07.2001)

D1 relates to alumina nanotube finely controlled in size and structure, and a method of manufacturing a microstructure for providing a bundle of the alumina nanotube.

3. Novelty & Inventive step

Claims 13-19 of the present invention are the same as D1 in the technical field, and similar in the technical feature including alumina. However, the subject matter of claims 13-19 relates to a method of producing alumina nanotube, comprising the following steps: mixing a surfactant and an alumina precursor to produce a mixture; adding water into the mixture; hydrothermal synthesizing the mixture; and drying and calcining the mixture so as to remove residual surfactant, which differs from that of D1. Concerning the effect thereof, the present invention provides a method of manufacturing alumina nanotube by using only surfactant, an alumina precursor, and water without adding any solvent or additive, thereby facilitating mass production of alumina nanotube in a mild condition.

Claims 1-12 relate to a method of manufacturing a mesoporous alumina molecular sieve, comprising the following steps: mixing a surfactant and an alumina precursor to produce a mixture; adding water into the mixture; hydrothermal synthesizing the mixture; and drying and calcining the mixture so as to remove residual surfactant, which differs from that of D1. Concerning the effect thereof, the mesoporous alumina molecular sieve of the present invention is produced simply and economically since the size and distribution of the pores can be controlled without using conventional additives, thereby obtaining large surface area and superior thermal stability.

(Continued on Supplemental Sheet)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/KR2002/001951

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of:

Box No. V

Claims 20-30 relate to a method of manufacturing alumina nanotube, comprising the following steps: mixing a surfactant and an alumina precursor with an organic solvent to produce a mixture; adding water to the mixture; hydrothermal synthesizing the mixture; and drying and calcining the mixture so as to remove residual surfactant and further comprising a step of adding a lithium precursor either during the first step of mixing or after the step of calcining. Claims 31-33 relate to a hydrogen storage material which is obtained by adsorbing hydrogen on said alumina nanotube, which differ from D1 in the technical feature. Due to such a difference, the alumina nanotube of the present invention can effectively store and safely transport large amount of hydrogen in a small volume comparatively, and be used as a lithium secondary battery.

Thus, claims 1-33 of the present invention are novel and inventive under PCT Article 33(2) and (3).

4. Industrial Applicability

Claims 1-33 are industrially applicable under PCT Article 33(4).